

Dated: June 13, 1995.

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Rear Admiral, U.S. Coast Guard, Chief, Office of Engineering, Logistics and Development.

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## Federal Aviation Administration

### [Change to AC No. 120-42A]

#### **Proposed Appendix 7, Reduction of Operator's Inservice Experience Requirement Prior to the Granting of an ETOPS Operational Approval [Accelerated ETOPS Operational Approval], to Advisory Circular 120-42A, Extended Range Operation with Two-Engine Airplanes (ETOPS)**

#### **Correction**

In notice document 95-13403 beginning on page 28643 in the issue of Thursday, June 1, 1995, Appendix 7 of Advisory Circular 120-42A was inadvertently not published in the original document. Appendix 7 of Advisory Circular 120-42A reads as follows:

#### **Appendix 7: Reduction of Operator's in Service Experience Requirement Prior to the Granting of ETOPS Operational Approval (Accelerated ETOPS Operational Approval)**

##### **1. General**

a. Paragraph 9(b) of AC 120-42A states the following:

(1) (In service experience) guidelines may be reduced or increased following review and concurrence on a case-by-case basis by the Director, Flight Standards Service.

(2) Any reduction \* \* \* will be based on evaluation of the operators ability and competence to achieve the necessary reliability for the particular airframe/engine combination in extended range operations.

(3) For example, a reduction in inservice experience may be considered for an operator who can show extensive inservice experience with a related engine on another airplane which has achieved acceptable reliability.

(4) The substitution of in service experience which is equivalent to the actual conduct of 120-minute ETOPS operations will also be established by the Director, Flight Standards Service AFS-1, on a case by case basis.

b. The purpose of this appendix is to establish the factors which the Director, Flight Standards Service may consider in exercising the authority to allow reduction or substitution of operators inservice experience requirement in granting ETOPS Operational Approval.

c. Paragraph 7 of AC 120-42A states that \* \* \* the concepts for evaluating extended range operations with two-engine airplanes \* \* \* ensure that two-engine airplanes are consistent with the level of safety required for current extended range operations with three and four-engine turbine powered airplanes without unnecessarily restricting operation.

d. It is apparent that the excellent propulsion related safety record of two-engine airplanes has not only been maintained, but potentially enhanced, by the process related provisions associated with ETOPS Type Design and Operational Approvals. Further, currently available data shows that these process related benefits are achievable without extensive inservice experience. Therefore, reduction or elimination of inservice experience requirements may be possible when the operator shows to the FAA that adequate and validated ETOPS processes are in place.

e. The Accelerated ETOPS Operations Approval Program with reduced inservice does not imply that any reduction of existing levels of safety should be tolerated but rather acknowledges that an operator may be able to satisfy the objectives of AC 120-42A by a variety of means of demonstrating that operator's capability.

f. This Appendix permits an operator to start ETOPS operations when the operator has demonstrated to the FAA that those processes necessary for successful ETOPS operations are in place and are considered to be reliable. This may be achieved by thorough documentation of processes, demonstration on another airplane/ validation (as described in paragraph 7 of this Appendix) or a combination of these.

##### **2. Background**

a. When AC 120-42 was first released in 1985 ETOPS was a new concept, requiring extensive inservice verification of capability to assure the concept was a logical approach. At that time, the FAA recognized that reduction in the inservice experience requirements or substitution of inservice experience, on another airplane, would be possible.

b. The ETOPS concept has been successfully applied for close to a decade; ETOPS is now widely employed. The number of ETOPS operators has increased dramatically, and in the North Atlantic U.S. airlines have more twin operations than the number of operations accomplished by three and four engine airplanes. ETOPS is now well established.

c. Under AC 120-42A, an operator was generally required to operate an airframe-engine combination for one (1) year, before being eligible for 120-minute ETOPS; and another one (1) year, at 120-minute ETOPS, before being granted 180-minute ETOPS approval. For example, an operator who currently has 180-minute ETOPS approval on one type of airframe-engine or who is currently operating that route with an older generation three or four engine airplane was required to wait for up to two (2) years for such an approval. Such a requirement could create undue economic burden on operators, while not contributing materially to safety. Data indicates that compliance with processes has resulted in successful ETOPS operation at earlier than the standard time provided for in the advisory circular.

d. ETOPS operational data indicates that twins have maintained a high degree of reliability due to implementation of specific maintenance, engineering and flight operation process related requirements. Compliance with ETOPS processes is crucial in assuring high levels of reliability of twins. Data shows that previous experience on an airframe-engine combination prior to operating ETOPS, does not necessarily make a significant difference in the safety of such operations. Commitment to establishment of reliable ETOPS processes has been found to be a much more significant factor. Such commitment, by operators, to ETOPS processes has, from the outset, resulted in operation of twins at a mature level of reliability.

e. ETOPS experience of the past decade shows that a firm commitment by the operator to establish proven ETOPS processes prior to the start of actual ETOPS operations and to maintain that commitment throughout the life of the program is paramount to ensuring safe and reliable ETOPS operations.

##### **3. Definitions**

a. *Process*. A process is a series of steps or activities that are accomplished, in a consistent manner, to assure that a desired result is attained on an ongoing basis. Paragraph 4 documents ETOPS processes that should be in place to ensure a successful Accelerated ETOPS program.

b. *Proven Process*. A process is considered to be proven when the following elements are developed and implemented:

(1) Definition and documentation of process elements.

(2) Definition of process related roles and responsibilities.

(3) Procedure for validation of process of process elements.

(i) Indications of process stability/reliability.

(ii) Parameters to validate process and monitor (measure) success.

(iii) Duration of necessary evaluation to validate process.

(4) Procedure for follow-up inservice monitoring to assure process remains reliable/stable.

Methods of process validation are provided in paragraph 7.

#### 4. ETOPS Processes

a. The two-engine airframe/engine combination for which the operator is seeking Accelerated ETOPS Operational Approval must be ETOPS Type Design approved prior to commencing ETOPS. The operator seeking Accelerated ETOPS Operational Approval must demonstrate to the FAA that it has an ETOPS program in place that addresses the process elements identified in this section.

b. The following are the ETOPS process elements:

(1) Airplane/engine compliance to Type Design Build Standard (CMP).

(2) Compliance with the Maintenance Requirements as defined in paragraph 10 and Appendix 4 of AC 120-42A:

(i) Fully developed Maintenance Program (Appendix 4, paragraph 1(a)(2)) which includes a tracking and control program.

(ii) ETOPS manual (Appendix 4, paragraph 1(a)(3)) in place.

(iii) A proven Oil Consumption Monitoring Program. (Appendix 4, paragraph 1(a)(5)).

(iv) A proven Engine Condition Monitoring and Reporting system. (Appendix 4, paragraph 1(a)(5)).

(v) A proven plan for Resolution of Airplane Discrepancies. (Appendix 4, paragraph 1(a)(6)).

(vi) A proven ETOPS Reliability Program. (Appendix 4, paragraph 1(a)(7)).

(vii) Propulsion system monitoring program (Appendix 4, paragraph 1(a)(8)) in place. The operator should establish a program that results in a high degree of confidence that the propulsion system reliability appropriate to the ETOPS diversion time would be maintained.

(viii) Training and qualifications program in place for ETOPS maintenance personnel. (Appendix 4, paragraph 1(a)(9)).

(ix) Established ETOPS parts control program (Appendix 4, paragraph 1(a)(10)).

(3) Compliance with the Flight Operations Program as defined in

paragraph 10 and Appendix 5 of AC 120-42A:

(i) Proven flight planning and dispatch programs appropriate to ETOPS.

(ii) Availability of meteorological information and MEL appropriate to ETOPS.

(iii) Initial and recurrent training and checking program in place for ETOPS flight operations personnel.

(iv) Flight crew and dispatch personnel familiarity assured with the ETOPS routes to be flown; in particular the requirements for, and selection of, enroute alternates.

(4) Documentation of the following elements:

(i) Technology new to the operator and significant difference in primary and secondary power (engines, electrical, hydraulic and pneumatic) systems between the airplanes currently operated and the two-engine airplane for which the operator is seeking Accelerated ETOPS Operational Approval.

(ii) The plan to train the flight and maintenance personnel to the differences identified in paragraph 1 above.

(iii) The plan to use proven validated Training and Maintenance and Operations Manual procedures relevant to ETOPS for the two-engine airplane for which the operator is seeking Accelerated ETOPS Operational Approval.

(iv) Changes to any previously proven validated Training, Maintenance, or Operations Manual procedures described above. Depending on the nature and extent of any changes, the operator may be required to provide a plan for validating such changes.

(v) The validation plan for any additional operator unique training and procedures relevant to ETOPS.

(vi) Details of any ETOPS program support from the airframe manufacturer, engine manufacturer, other operators or any other outside person.

(vii) The control procedures when maintenance or flight dispatch support is provided by an outside person as described above.

#### 5. Application

a. Paragraph 10(a) of AC 120-42A requires that requests for extended range operations be submitted at least sixty (60) days prior to the start of extended range operations. Normally, the operator should submit an Accelerated ETOPS Operational Approval Plan to the FAA six (6) months before the proposed start of extended range operations. This time will permit the FAA to review the documented plans and assure adequate

ETOPS processes are in place. The operators application for Accelerated ETOPS should:

(1) Define proposed routes and the ETOPS diversion time necessary to support these routes.

(2) Define processes and related resources being allocated to initiate and sustain ETOPS operations in a manner that demonstrates commitment by management and all personnel involved in ETOPS maintenance and operational support.

(3) Identify, where required, the plan for establishing compliance with the build standard required for Type Design Approval, e.g., CMP (Configuration, Maintenance and Procedures Document) compliance.

(4) Document plan for compliance with requirements in paragraph 4.

(5) Define Review Gates. A Review Gate is a milestone tracking plan to allow for the orderly tracking and documentation of specific requirements of this Appendix. Each Review Gate should be defined in terms of the tasks to be satisfactorily accomplished in order for it to be successfully passed. Items for which the FAA visibility is required or the FAA approval is sought should be included in the Review Gates. Normally, the Review Gate process will start six (6) months before the proposed start of extended range operations and should continue at least until six (6) months after the start of extended range operations. Assume that the proven processes comply with the provisions of paragraph 3 of this Appendix.

#### 6. Operational Approvals

a. Operational approvals that are granted with reduced inservice experience will be limited to those areas agreed on by the FAA at approval of the Accelerated ETOPS Operational Approval Plan. When an operator wishes to add new areas to the approved list, FAA concurrence is required.

b. Operators will be eligible for ETOPS Operational Approval up to the Type Design Approval limit, provided the operator complies with all the requirements in paragraph 4.

#### 7. Process Validation

a. Paragraph 4 identifies those process elements that need to be proven prior to start of Accelerated ETOPS.

b. For a process to be considered proven, the process must first be defined. Typically this will include a flow chart showing the various elements of the process. Roles and responsibilities of the personnel who will be managing this process should be defined including any training requirement. The operator should

demonstrate that the process is in place and functions as intended. The operator may accomplish this by thorough documentation and analysis, or by demonstrating on an airplane that the process works and consistently provides the intended results. The operator should also show that a feedback loop exists to illustrate need for revision of the process, if required, based on inservice experience.

c. Normally the choice to use, or not use, demonstration on an airplane as a means of validating the process should be left up to the operator. With sufficient preparation and dedication of resources such validation may not be necessary to assure processes should produce acceptable results. However, in any case where the proposed plan to prove the processes is determined by the FAA to be inadequate or the plan does not produce acceptable results, validation of the process in an airplane will be required.

d. If an operator is currently operating ETOPS with a different airframe and/or engine combination it may be able to document that it has proven ETOPS processes in place and only minimal further validation may be necessary. It will, however, be necessary to demonstrate that means are in place to assure equivalent results will occur on the airplane being proposed for Accelerated ETOPS Operational Approval. The following elements which while not required, may be useful or beneficial in justifying a reduction in the validation requirements of ETOPS processes:

- (1) Experience with other airframes and/or engines.
- (2) Previous ETOPS experience.
- (3) Experience with long range, overwater operations with two, three or four engine airplanes.
- (4) Experience gained by flight crews, maintenance personnel and flight dispatch personnel while working with other ETOPS approved operators.

e. Process validation may be done in the airframe-engine combination that will be used in Accelerated ETOPS operation or in a different type airplane than that for which approval is being sought, including those with three or four engines.

f. A process may be validated by first demonstrating the process produces acceptable results on a different airplane type or airframe/engine combination. It should then be necessary to demonstrate that means are in place to assure equivalent results should occur on the airplane being proposed for Accelerated ETOPS Operational Approval.

g. Any validation program should address the following:

(1) The operator should show that it has considered the impact of the ETOPS validation program with regard to safety of flight operations. The operator should state in its application any policy guidance to personnel involved in the ETOPS process validation program. Such guidance should clearly state that ETOPS process validation exercises should not be allowed to adversely impact the safety of operations especially during periods of abnormal, emergency, or high cockpit workload operations. It should emphasize that during periods of abnormal or emergency operation or high cockpit workload ETOPS process validation exercises may be terminated.

(2) The validation scenario should be of sufficient frequency and operational exposure to validate maintenance and operational support systems not validated by other means.

(3) A means must be established to monitor and report performance with respect to accomplishment of tasks associated with ETOPS process elements. Any recommended changes to ETOPS maintenance and operational process elements should be defined.

(4) Prior to the start of the process validation program, the following information should be submitted to the FAA:

- (i) Validation periods, including start dates and proposed completion dates.
- (ii) Definition of airplane to be used in the validation. List should include registration numbers, manufacturer and serial number and model of the airframes and engines.
- (iii) Description of the areas of operation (if relevant to validation objectives) proposed for validation and actual extended range operations.

(iv) Definition of designated ETOPS validation routes. The routes should be of duration necessary to ensure process validation occurs.

(5) Process validation reporting—The operator should compile results of ETOPS process validation. The operator should:

- (i) Document how each element of the ETOPS process was utilized during the validation.
- (ii) Document any shortcomings with the process elements and measures in place to correct such shortcomings.
- (iii) Document any changes to ETOPS processes that were required after an inflight shut down (IFSD), unscheduled engine removals, or any other significant operational events.

(iv) Provide periodic Process Validation reports to the FAA. This may be addressed during the Review Gates.

**Thomas C. Accardi,**

*Director, Flight Standards Service.*

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### **Noise Exposure Map Notice; Receipt of Noise Compatibility Program and Request for Review; Fort Lauderdale-Hollywood International Airport, Fort Lauderdale, FL**

**AGENCY:** Federal Aviation Administration, DOT.

**ACTION:** Notice.

**SUMMARY:** The Federal Aviation Administration (FAA) announces its determination that the updated noise exposure maps submitted by the Broward County Aviation Department, Fort Lauderdale, Florida for Fort Lauderdale-Hollywood International Airport under the provisions of Title I of the Aviation Safety and Noise Abatement Act of 1979 (Public Law 96-193) and 14 CFR part 150 are in compliance with applicable requirements. The FAA also announces that it is reviewing a proposed noise compatibility program update that was submitted for Fort Lauderdale-Hollywood International Airport under part 150 in conjunction with the noise exposure maps, and that this program update will be approved or disapproved on or before November 28, 1995.

**EFFECTIVE DATE:** The effective date of the FAA's determination on the updated noise exposure maps and of the start of its review of the associated noise compatibility program update is June 1, 1995. The public comment period ends July 31, 1995.

**FOR FURTHER INFORMATION CONTACT:** Mr. Tommy J. Pickering, P.E., Federal Aviation Administration, Orlando Airports District Office, 9677 Tradeport Drive, Suite 130, Orlando, Florida 32827-5397, (407) 648-6583. Comments on the proposed noise compatibility program update should also be submitted to the above office.

**SUPPLEMENTARY INFORMATION:** This notice announces that the FAA finds that the updated noise exposure maps submitted for Fort Lauderdale-Hollywood International Airport are in compliance with applicable requirements of part 150, effective June 1, 1995. Further, FAA is reviewing a proposed noise compatibility program update for that airport which will be approved or disapproved on or before November 28, 1995. This notice also